Remarks

The above Amendments and these Remarks are in reply to the Office action mailed February 12, 2003. Claims 1- 8, 11, 13 - 22, and 24 -25 are presented herewith for consideration.

Summary of the Amendments

Claim 1 has been amended; claims 9 – 10, 12 and 23 have been deleted.

Rejection of Claims 1-6, 8-12, 17-25 Under 35 U.S.C. §102(e)

It is respectfully submitted that claims 1-6, 8-12, 17-25 are novel. The claims were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,301,965 to *Chu et al.* et al. ("*Chu et al.*").

It is respectfully submitted that claims 1-6, 8, 11, 17- 22, and 24-25 do not show:

> at least a first and a second *electrically decoupled sense capacitors*, *each* of said first and second capacitors *comprising* at least *a first independent terminal on said proof mass and a second independent terminal on said substrate*; (emphasis added)

The invention as now defined in claim 1, and by their dependency, claims 2 – 6, 8, 11, 17- 22, and 24-25 includes "electrically decoupled sense capacitors". Fig. 2 of the present application, and the accompanying text, discusses that each sense capacitor is formed by "electrically decoupled sense capacitors":

> *Anchor points **54a,b, 64a,b** are electrically isolated from substrate **58** by dielectric-filled trenches.* ...the structure illustrated Figure 2 comprises a single proof-mass with capacitors formed by the following pairs of electrodes: **60a**, **62a**; **60b**, **62b**; **50a**, **52a**; **50b**, **52b**. Electrical connections may be constructed between electrodes **60a** and **60b** forming one sense capacitor having a value that increases for proof-mass displacements along the positive direction of the axis of sensitivity. Likewise, electrical connections may be constructed between electrodes **50a** and **50b** forming a second sense capacitor having a value that decreases for proof-mass displacements along the positive direction of the axis of sensitivity. (Page 8, lines 3 - 20) (Emphasis Supplied)

Since each and every feature of the claimed invention is not disclosed in the *Chu et al.* reference, *Chu et al.* cannot anticipate the claimed invention.

Although a similar limitation was formerly present in Claims 10 and 23, (also rejected under 35 U.S.C. §102(e)), it is respectfully submitted that the feature of "...first and a second electrically decoupled sense capacitors, each ...comprising at least a first independent terminal on said proof mass and a second independent terminal on said substrate" is not shown in *Chu et al.*

The Examiner stated, with respect to the rejection of Claims 10 and 23 under 35 U.S.C. §102(e), that *Chu et al.* discloses:

> "... in Figs. 1 and 6 a plurality of substrates 16 with the individual accelerometers... the sensing activity of the accelerometer 10 is increased by ganging the various electrodes 30, 32 and 36, a pair of oppositely connected single-proof-mass and a substrate...." (Office Action, pp. 3-4)

Chu et al. discloses that multiple substrates may be used to build multiple accelerometer structures, and then electrically combined. There is no teaching from the reference of constructing an accelerometer using a "plurality of substrates" where more than one electrically isolated capacitors is provided relative to *the same* "proof mass". Indeed, there is no specific teaching that any isolation be provided between the electrodes. The Examiner cited passages at Col. 8, lines 31 – 35 and Col. 13 lines 50 – 55 teach only replicating the structure shown in Figs. 1 and 6 multiple times, not providing multiple isolated electrodes relative to "said proof mass". For example, with respect to Fig. 1, *Chu et al.* states:

> Such a multi-axis MEM accelerometer can be formed either on a common substrate 16, or on a plurality of substrates 16 with the individual MEM accelerometers providing acceleration outputs to a signal processing and readout unit (Col. 8, lines 31 – 35)

Further with respect to Fig. 6, the cited passage provides:

> In the example of FIG. 6, the dual-proof-mass MEM accelerometer structure 70 can be formed from a pair of oppositely connected *single-proof-mass MEM accelerometer* structures 12 as described previously with reference to FIG. 1 (Col. 13 lines 50 – 55) (Emphasis Supplied)

At most, *Chu et al.* teaches repeating the structure of Figs. 1 and 6 on multiple substrates. Such structure does not disclose a single accelerometer structure where "...*each* of said first and second [electrically decoupled]

capacitors [comprise] at least a first independent terminal *on **said** proof mass* and a second independent terminal on said substrate...." (Emphasis supplied). Rather, the clear understanding from the passages of *Chu et al.* referenced by the Examiner are that multiple individual accelerometers of the configuration shown in Figs. 1 and 6 are constructed and electrically connected.

Hence, each and every feature of the claimed invention is not disclosed in *Chu et al.* Hence, it is respectfully submitted that *Chu et al.* does not anticipate the invention defined in claim 1. Moreover, it is respectfully submitted that claims 2 – 6, 8, 11, 17- 22, and 24-25 being dependent on Claim 1 and including all the limitations thereof, are likewise not anticipated by *Chu et al.*

Rejection of Claim 7 Under 35 U.S.C. §103(a)

Claim 7 is rejected under 35 U.S.C. §103(a) as being unpatentable over *Chu et al.* in view of U.S. Patent No. 6,396,032 to Lemkin et al. ("*Lemkin et al.*").

It is respectfully submitted that the *Chu et al.* and Lemkin fail to teach:

> at least a first and a second electrically decoupled sense capacitors, each of said first and second capacitors comprising at least a first independent terminal on said proof mass and a second independent terminal on said substrate;

as defined in claim 1, combined where the "feedback is frequency multiplexed" as defined in claim 7.

As noted above, *Chu et al.* fails to teach the feature of the present invention quoted above as defined in claim 1. Hence, there is no teaching of combining such electrically isolated sense capacitors with a frequency multiplexed output. As such, one of average skill in the art would not be led to construct the invention defined in claim 7 since there is no teaching that would lead such person to provide the feature set forth above.

Hence, it is respectfully submitted that claim 7 is not obvious over *Chu et al.* et al. in view of *Lemkin et al.*

Rejection of Claims 13-16 Under 35 U.S.C. §103(a)

Claims 13-16 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Chu et al.* in view of

U.S. Patent No. 6,230,566 to Lee et al. ("*Lee et al.*").

It is respectfully submitted that the *Chu et al.* and Lemkin fail to teach:

> at least a first and a second electrically decoupled sense capacitors, each of said first and second capacitors comprising at least a first independent terminal on said proof mass and a second independent terminal on said substrate;

as defined in claim 1, combined with "...a first and a second reference capacitor" as defined in claim 13, and by their dependency on claim 13, claims 14 – 16.

As noted above, *Chu et al.* fails to teach the feature of the present invention quoted above as defined in claim 1. Hence, there is no teaching of combining such electrically isolated sense capacitors with a first and a second reference capacitor as defined in claim 13. As such, one of average skill in the art would not be led to construct the invention defined in claim 13, and by their dependency on claim 13, claims 14 – 16, since there is no teaching that would lead such person to provide the feature set forth above.

Hence, it is respectfully submitted that claims 13 – 16 are not obvious over *Chu et al.* et al. in view of *Lee et al.*

Based on the above amendments and these remarks, reconsideration of Claims 1 – 8, 11, 13 - 22, and 24-25 is respectfully requested.

The Examiner's prompt attention to this matter is greatly appreciated. Should further questions remain, the Examiner is invited to contact the undersigned attorney by telephone.

Enclosed is a PETITION FOR EXTENSION OF TIME UNDER 37 C.F.R. § 1.136 for extending the time to respond up to and including today, August 12, 2003.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 501826 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

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By: _____
Larry E. Vierra
Reg. No. 33,809

VIERRA MAGEN MARCUS HARMON & DENIRO LLP
685 Market Street, Suite 540
San Francisco, California 94105-4206
Telephone: (415) 369-9660
Facsimile: (415) 369-9665